SOMP40 Probe User Manual

Contents

1.1 Preface

First of all, thank you for buying our CNC machine tool touch probe SOMP40 now , you can use advanced measurement tools to solve machining problems. Especially suitable for incoming deformation or unstable size of batch products.

It is imperative that the safety information contained in these operating instructions is strictly observed to guarantee the safe and reliable operation of the touch probe and avoid personal injury and damage to property.

if there are any difficulties, comments and suggestions in the process of using our products, you are welcome to contact us at any time through telephone or email , and also visit website to learn about the products .

Email: liuxuan@silvercnc.com
Tel：+86 180 9892 0890
Website: Http://www.silvercnc.com

1.2 Safety Instructions

Risk of material damage!

• Guard the manual or automatic positioning of the touch probe to ensure that the machine comes to an immediate feed stop if the stylus is inadvertently deflected from the sensing process!

Risk of material damage!

• A feed or spindle stop, triggered by a switching signal or standby signal from a touch probe, can only occur if a touch probe is actually inserted in the spindle. This safety logic prevents the spindle or feed being stopped during normal milling operations if a signal from a measuring probe is triggered for one of the following reasons:

• Battery change and subsequent functional check of the probe by manually switching it on.

Risk of material damage from by third-party components!

• Only use the original spare parts listed in these operating instructions to perform maintenance and repairs.

The information given in these operating instructions can be modified by the manufacturer without prior notification. It is therefore the responsibility of the user to enquire regularly about updated operating instructions.

1.3 Declaration of Conformity

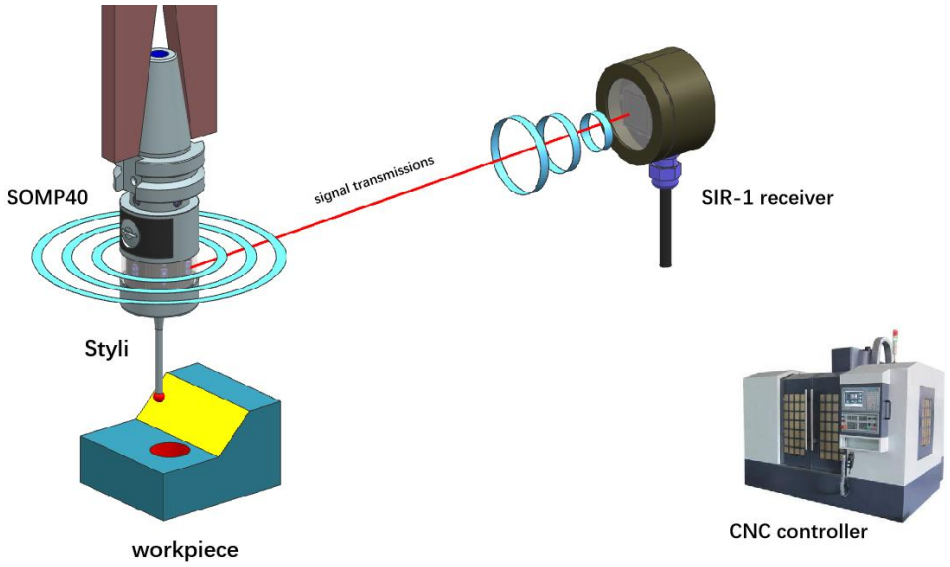
The EC Declaration of Conformity can be found at the end of these operating instructions.If required, a copy of the signed original declaration of conformity may be requested from the address given on the back cover

1.4 Validity

This document is valid for the hardware available at the creation date of the manual itself. Technical changes by the manufacturer are reserved.The latest version of this manual can be downloaded under www.silvercnc.com in the Downloads section.

2.1 System components

As shown in the figure, the probe system is composed of four parts: work piece, probe, receiver and machine tool controller. Touch trigger signal is transmitted between the probe and the machine controller through the receiver . The converts the trigger signal of the probe into a form acceptable to the machine tool controller for signal recognition, processing, calculation and feedback to the machine tool.



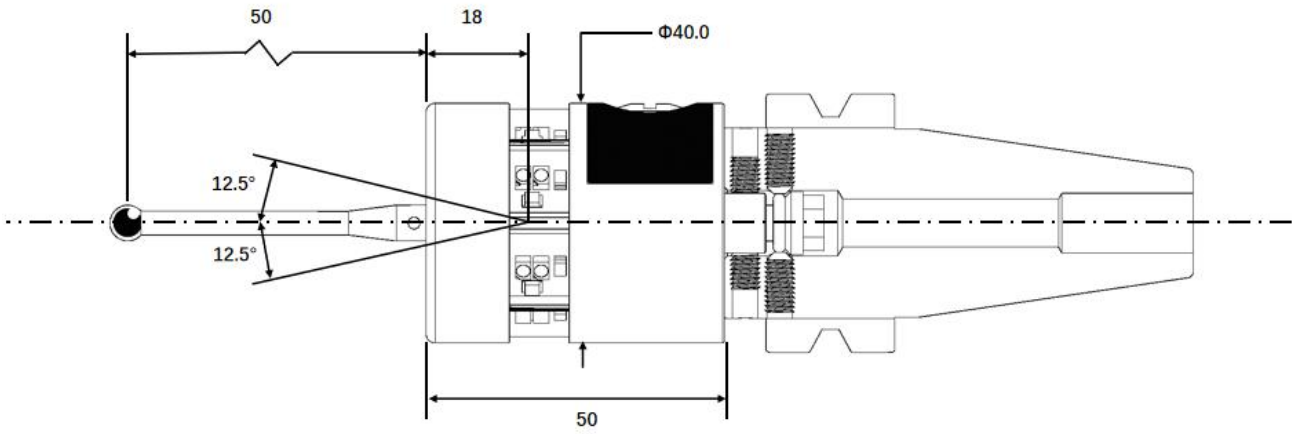
2.2 SOMP40 specification

Model	SOMP40	
Unidirectional repeatability Use standard 50mm probe at 600mm/min speed	1um (2σ)	
Sense directions	±X,±Y,+Z	
Stylus trigger force Use standard 50mm probe	XY plane 0.4 - 0.8N	Z direction 4.0N
Trigger protection trip	XY plane	Z direction

2.SOMP40 basics

	+/-15°	6.35mm
Signal transmission method	Optical transmission	
Operating range	5m	
Trigger life	>10 Million times	
Transmission angle	360 ° along the probe axis	
Transmission on/off style	smart switch	
Weight without shank (including batteries)	280g	
type of battery	2x lithium battery 14250	
battery life	Standby	>600 days
	5% use	>540 days
	continue use	>360 days
Sealing	IP68	
Operating temperature	0-60℃	

2.3 SOMP40 dimensions

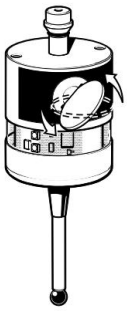


Stylus overtravel limits		
Stylus length	±X/±Y	+Z
50	13.5	6.25
100	24	6.25

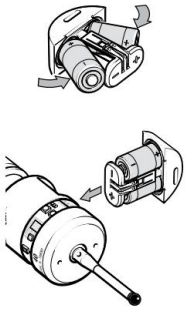
2.4 Delivery Contents

Type	Model	Quantity（PCS）	Remark
probe	SOMP40	1	/
tool holder	BT30/40/50	1	Optional CAT/HSK/SK/ISO
receiver	SIR-1	1	5m cable
pull stud	BT30/40/50	1	Optional
Magnet base	standard	1	easy to install
battery	LS14250/pair	1	SAFT brand
stylus	2 * 50 Ruby	1	Optional

3.1 Installing the batteries



Step 1: Unlock the battery cassette

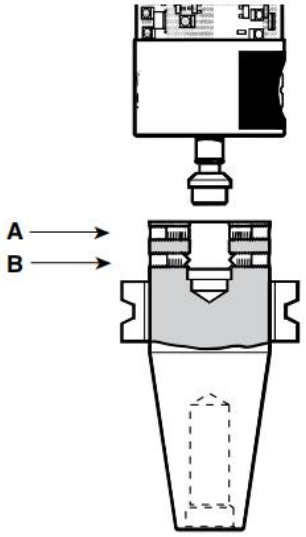


Step 2: Insert the batteries Step

3: Lock the battery cassette

3.2 Mounting stud, tool holder and stylus

1. Fully slacken screws A. Then grease screws B, and fit to shank.
2. Fit the probe onto the shank, and visually position the probe centrally relative to the shank. Partially tighten screws B to 1 N.m.
3. Fit the probe/shank assembly into the machine spindle.



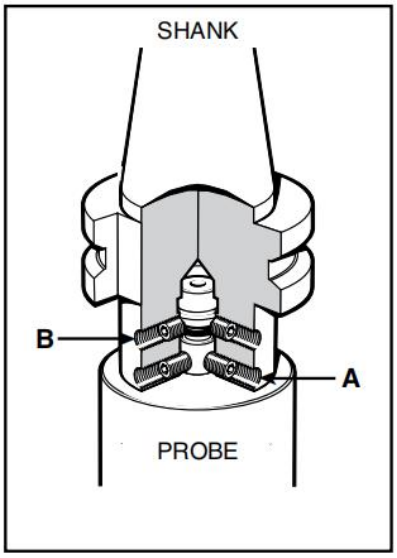
3.3 On-centre adjustment

1.There are four screws A. Each will move the probe relative to the shank, in the X or Y direction as pressure is applied. Tighten individually, backing off after each movement.

2. When centering with screws A, progressively tighten as the final setting is approached. Slackening on one side and tightening the opposite screw, in sequence.

3. When the stylus tip run-out is less than 20 µm, fully tighten screws B to max 2.2 N.m , and use screws A in opposition to move the probe at the same time. Use two hexagonal keys if necessary. Tip run out of 5 µm should be achievable.

4. It is important that all four screws A are tight or tightened to a maximum of 2.2 N.m once the final setting has been achieved.



3.4 Installing SIR-1 Receiver And Signal Test

Model	SIR-1
Output signal	Power On signal or Trigger Signal
Mounting	Strong Magnetic Base / Universal Support
Supply voltage	24VDC +/-4VDC
Cable	5.0mm
IP rating	IP68
Operating temperature	10°- 60°

SIR-1 wired:

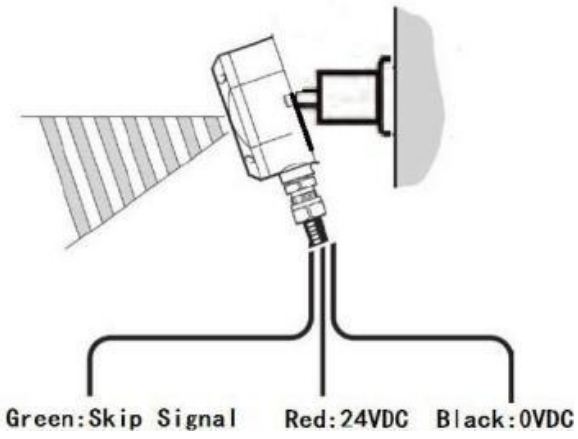
Red：+24V DC

Black：0V DC

Green：Skip signal to CNC controller

Yellow：Low battery signal

(This wire not necessary to be connected)



Signal Test (FANUC X4.7 example)

1. System –PMC - when touch the styli, Check the state value, X4.7 maybe changed to 1 from 0.
2. Turn to the MDI mode and input below :

G91 G31 X100. F100.;

G91 G01 Y100.F100.;

If only X axis changes at the beginning, when touch the probe styli , only Y axis changes, which proving G31 jump function is normal, receiver installed successfully.

Attention:

1. SILVERCNC touch probe is pulse signal, normally open, it's not necessary to open or close the probe with M code.

2. After wiring the yellow line and changing PLC, alarm will appear when the battery is low voltage. If you don't want wire the yellow line, when the battery voltage is insufficient, the probe will flash a yellow light to remind that the voltage is insufficient and need to replace battery. The battery life can reach 10 months in normal use.

3.5 Receiver wired example

FANUC 0iMC/MD/MF 21iMB/18iMB

Red wire: 24V DC

Black wire: 0V DC

Green wire: X4.7(SKIP)

Yellow wire: 0V DC

Parameter setting: system parameters 6200:10010000/ 6201: 00000010/ 6202:00000001

Check the jump signal: when touching the probe, the signal of system -PMC maintenance -X4.7 changes from 0 to 1.

MITSUBISHI E68/M70/M80

Red wire: 24V DC

Black wire: 0V DC

Green wire: SKIP Or SKIP1

Yellow wire: SKIP Or COM interface

Parameter setting: System default

Check the jump signal: When touching the probe, the signal of the CNC system DIAG-IF-X6F8 changes from 0 to 1

SIMENS 828D

Red wire: 24V interface (24VNC) behind the operation panel (Note: 24V should be connected to 8 pin 8 of -X22)

Black wire: 0V interface behind the operation panel (0V)

Green wire: -X122 wiring group 13 pin (IO11)

Yellow wire: -X122 wiring group 14 pin (M1)

Parameter setting: System default

Check the jump signal: When touching the probe, diagnosis - NC/PLC variable - input DB2700.DBX1.0 - from 0 to 1 is valid

3.6 Calibrating the SOMP40

Why calibrate a probe?

A spindle probe is just one component of the measurement system which communicates with the machine tool. Each part of the system can introduce a constant difference between the position that the stylus touches and the position that is reported to the machine. If the probe is not calibrated, this difference will appear as an inaccuracy in the measurement. Calibration of the probe allows the probing software to compensate for this difference.

During normal use, the difference between the touch position and the reported position does not change, but it is important that the probe is calibrated in the following circumstances:

•when a probe system is to be used for the first time;

•when the enhanced trigger filter delay is changed;

•when a new stylus is fitted to the probe;

•when it is suspected that the stylus has become distorted or that the probe has been crashed;

•at regular intervals to compensate for mechanical changes of your machine tool;

Calibrating in a ring gauge

Calibrating a probe either in a ring gauge with a known diameter automatically stores one or more value for the radius of the stylus ball. The stored values are then used automatically by the measuring cycles to give the true size of the feature. The values are also used to give true positions of single surface features.

Calibrating the probe length

Calibrating a probe on a known reference surface determines the length of the probe, based on the electronic trigger point. The stored value for length is different from the physical length of the probe assembly. Additionally, the operation can automatically compensate for machine and fixture height errors by adjusting the probe length value that is stored.

3.7 Calibration program example

This example describes how to use macro programs O9801, O9802, and O9804 to perform complete probe calibration on an internal profile. Marco is available on request.

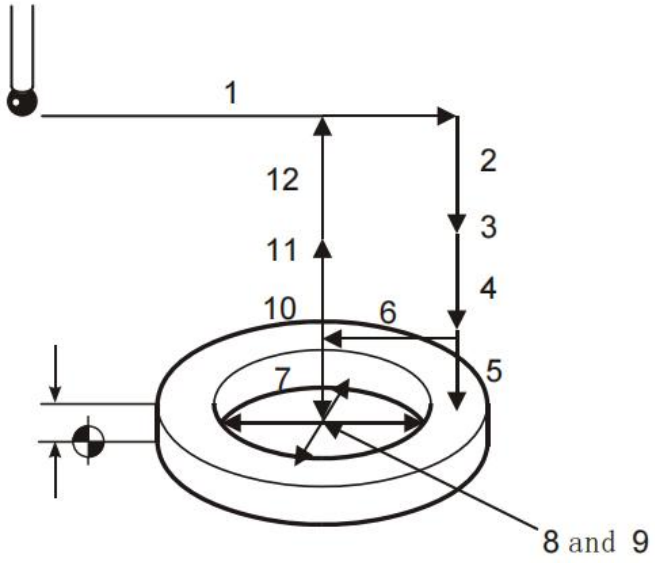


Fig. Complete calibration performed on the internal surface

Suppose a ring gauge of 50.001mm diameter with known center position and end height is used. Before running this program, do the following.

• Enter an approximate probe length in the tool offset register.

• Set the exact X, Y, and Z positions of the stereotypes to a work piece coordinate system (G54 is used in this example)

O 0006	
G90G80G40G0	Machine tool G code
G54X35Y0	Move to off-center position for length calibration
G43H1Z100.	Activate 1 cutter offset, position to 100mm
G65P9832	Turn on probe (including M19) or M19 for spindle orientation
G65P9810Z30.F3000	Protection positioning movement
G65P9801Z20.006T1	Calibration of probe length. The surface is at 20.006 mm

G65P9810X0Y0	Protection positioning movement
G65P9810Z5	positioned into the hole
G65P9802D50	Calibrate the probe in a 50 mm diameter bore to determine its X and Y styli offset
G65P9804D50.001	Calibrate the probe in a 50.001 mm diameter ring gauge to determine the ball diameter, including vector direction
G65P9810Z30.F3000	Move guard position back to 100 mm
G65P9833	Rotary closing probe (if applicable)
G28Z100.	Return to the reference position
H00	Cancel the tool offset
M30	End of program

3.8 Trigger LED Status Display

SOMP40 probe led light display：

LED with the following display features：

- Installed battery: red/blue/yellow lights flashing：
- Low battery: yellow light：
- Styli trigger: red light flash：

SIR-1 led light display：

The receiver led uses 2 colors (blue / green) led display. It has the following display functions：

Turn on : blue / green light flashes：

Standby: Blue light always on：

Receiving the trigger signal: the blue indicator is off for 150ms and then normal on：

4. Fault-finding

Symptom	Cause	Action
Light touch stylus, probe indicator light not on	Dead batteries.	Change batteries.
	Unsuitable batteries.	Change batteries.
	Batteries inserted incorrectly	Check battery insertion/polarity.
	Poor connection of battery.	Remove any dirt and clean.
Light touch stylus, probe indicator light on bot the receiver light not on	A/B channel do not match.	Check the color of the Lights.
	Dead batteries.	Change batteries.
	Machine power supply fault.	Check the machine power supply.
The measurement does not start the machine tool to alarm (such as obstacle alarm)	The skip signal fault.	Check the skip signal.
	False probe trigger.	Check machine tool's abnormal jitter.
	Receiver/machine fault.	Refer to machine user’s guide.
Accidental stop and alarm during measurement cycle (e.g. probe fail alarm)	Dead batteries.	Change batteries.
	Probe unable to find target.	Check work piece position.
	Optical/magnetic interference.	Check the interference.
	Receiver/machine fault.	Check the Receiver.
Probe crashes.	Work piece obstructing probe path.	Review probing software.
	Probe length offset missing.	Review probing software.
Poor probe repeatability and accuracy.	Debris on part or stylus.	Clean part and stylus.
	Poor tool change repeatability.	calibrate after each tool change.
	Loose probe mounting on shank.	Check and tighten as appropriate.
	Probing speed too high/slow.	Review probing software.

5.Maintenance

SOMP40 main body and stylus are made of antirust material, so special attention should be paid to the moisture-proof and rust-proof of this part. When using the probe, contact between the shank and cutting liquid which can produce rust should be avoided; if it can not be avoided, the surface of the probe should be cleaned in time after use. When storing the probe, cover antirust oil above probe surface.

Fault maintenance for stylus reset：

The trigger probe may have a pin reset fault, that is, the stylus has been separated from the work piece surface, but the stylus has not been reset normally. When the stylus reset is abnormal, the work should be suspended, the stylus should be triggered several times by hand wrench, and the reset of the stylus should be observed. If normal, it can continue to work, otherwise, it can be tried several times. If the failure frequency is very high, it may be serious wear of the internal parts of the probe, please contact our sales department.

Battery maintenance：

Battery bin cover of probe is the main part that may let cutting fluid and other liquids into battery bin. When replacing battery, it is necessary to rotate the bin cover into a reasonable position and check whether the o rubber ring on the cover is in good condition. If you do not use the probe for a long time, take out the battery.

6. Warranty

1. Warranty commitments

If the warranty conditions are met, the company shall carry out 12 months free warranty for the failure of the SOMP40/SIR-1 probe system under normal operation; the warranty period shall be calculated from the date of delivery completed on the warranty form at the time of delivery of the company. The warranty period is 12 months. If the user receives the product and finds that the date of receipt is more than 20 days apart from the date of delivery, the user shall notify the company by telephone within 3 days of receipt of the product in order to extend the warranty period.

2. Warranty conditions

1.Customer did not remove SOMP40 probe body except battery bin cover；

2.No visible impact marks on the outer surface of the probe body;

3.The indicator light on the main body of the probe is not damaged or loosened ;(high speed rotation may cause damage to the circuit board!)

4.The fault of the probe was not caused by the inlet of the battery bin cover, and the rubber sealing ring of the battery cover was not damaged or lost；

5.The axial reset elastic force of the stylus does not decrease or disappear obviously (only the phenomenon caused by impact).

Finally, thank you again for using our products!

For more products details, please visit our website at
www.silvercnc.com/contact